Remarks

Reconsideration of this Application is respectfully requested.

A Notice of Non-Compliant Amendment was filed on February 25, 2009 in response to the June 18, 2007 Amendment. Upon entry of the foregoing amendment, claims 1-20 are pending in the application, with claims 1-8 being independent claims. Claims 1-10 have been amended to correct for grammatical errors. Claims 11-20 are newly added. Descriptive support for the amended claims is found in the claims and the original specification as filed. The amendment introduces no new matter, and its entry is respectfully requested.

Office Action of April 24, 2006

Claims 1, 2-5, 8 and 9 have been rejected under 35 U. S.C. 5 102(e)[1] as being anticipated by United States Patent Publication Number 2002/0162915 ("Mitani");

Claim 1 has been rejected under 35 U.S.C. §103(a) as being obvious over Mitani in view of Irish Publication ("Radowitz"); and

Claims 6, 7 and 10 have been rejected under 35 U. S.C. 5 103(a) as being obvious over Mitani in view of United States Patent Number 4,282,870 ("Porlier").

The Cited References

In order to better understand the scope and content of the prior art, the following excerpts are provided based on the citations made in the Action. Regarding Mitani, the three referenced paragraphs [0019], [0020], [0021] and [0024] are provided in the left-hand column of the next page while paragraphs from Porlier concerning nitrogen are provided in the right-hand column and Radowitz is shown therebelow.

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[1] Examiner is reminded that for there to be anticipation under 35 U.S.C. 51 02, "each and every element" of the claimed invention must be found either expressly or inherently described in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) and references cited therein. See also *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986) ("absence from the reference of any claimed element negates anticipation."); *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997). As pointed out by the court, "[tlhe identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). An anticipating reference must describe the patented subject matter with sufficient clarity and detail to establish that the subject matter existed and that its existence was recognized by persons of ordinary skill in the field of the invention. *ATD Crop. V. Lydall, Inc.*, 159 F.3d 534, 545, 48 USPQ 2d 1321, 1328 (Fed. Cir. 1998). See also *In re Spada*, 91 1 F.2d 705, 708, 15 USPQ 2d 1655, 1657 (Fed. Cir. 1990).

MITANI

[0019] The environment control unit for an airplane of this embodiment further comprises an oxygen extracting portion 19 that draws the air from the cabin 2, takes an oxygen and water molecule alone out of the air drawn from the cabin 2 and supplies the oxygen and water molecule to the cabin 2 again.

[0020] The oxygen extracting portion 19 extracts a part of the air from the cabin 2, compresses it with a compression ratio of about 3.5 by the use of an electric compressor 20, separates it into air enriched with nitrogen (N_2 rich) and air enriched with oxygen and vapor (O_2,H_2O rich) by the use of a selectively permeable membrane 21 which permeates an oxygen molecule and a water molecule and then supplies the air enriched with oxygen and vapor into the cabin 2 again by making use of the circulation line 15. More concretely, the air enriched with oxygen and vapor that is introduced into the circulation line 15 is mixed with the air in the cabin 2 and then refrigerated by the evaporator 12. The nitrogen that does not permeate the selectively permeable membrane 21 is introduced into a fuel tank 41 as air enriched with nitrogen and overflow air enriched with nitrogen is discharged into out of the airplane.

[0021] In accordance with the arrangement of the environment control unit for an airplane, oxygen alone out of the air drawn from the cabin 2 is supplied to the cabin 2 again. This makes it possible to maintain oxygen concentration at a level enough for passengers in the cabin 2 to spend comfortably even though an extracting amount of air for supplying fresh air is reduced by the maximum of 30 percent. In addition, it is possible to prevent explosion in the fuel tank 41 without a necessity of extracted air exceeding the amount necessary for air conditioning, namely, without deteriorating propulsive force nor fuel efficiency. To supply air enriched with nitrogen with an inflammable portion improves safety of the airplane. As a result, it is possible to reduce the amount of extracted air by far without deteriorating reliability of the airplane nor comfortability for the passengers, thereby to improve fuel efficiency and propulsive force.

[0024] In case that the airplane cruises at a high altitude, the temperature of the airplane surface rises due to heat generated by passengers or electronic equipment, which will lead the air conditioning into a slight cooling mode even at extremely low temperature of atmosphere (approximate minus 60 degrees Celsius). In this case, there is no need of refrigerating the air down with the vapor cycle system 6. The air that is refrigerated by the heat exchanger 5 and the extracted air whose temperature is controlled by a temperature control valve 23 are mixed with by-passed as shown by imaginary line in FIG. 1 and supplied to the cabin 2. Needless to say the above-mentioned effect can also be produced with this arrangement.

PORLIER

This invention relates generally to oxygen generators of the type used in aircraft pilot life support systems to draw gases from engine bleed air and to provide oxygen to the pilot, and more particularly to a device adapted to be inserted in the life support system to cause an excess demand on the oxygen generator at lower altitudes so that an oxygen/nitrogen mixture is drawn from the generator.

It has been proposed more recently to use air from outside the aircraft and in particular to collect a small fraction of the bleed air from an engine and to use this as the basis for the pilot's breathing mixture. The bleed air is filtered by a molecular filter or sieve. The gas leaving the filter consists almost essentially of oxygen although because of the molecular structure of argon, a small percentage of argon (about 5%) is also present. At lower altitudes it is advantageous to mix the gas coming from the filter with air in order to provide nitrogen in the breathing mixture thereby preventing lung atelectasis induced by positive "g" forces when breathing pure oxygen.

It has been found that one of the characteristics of the oxygen generator is that when it is overloaded it permits nitrogen to pass as well as oxygen. The present invention takes advantage of this characteristic and in effect causes an excess flow from the oxygen generator at lower altitudes so that the resulting breathing mixture includes nitrogen. The invention provides an arrangement whereby the nitrogen content varies with altitude so that the pilot while breathing normally and gaining altitude will commence at ground level with a normal breathing mixture and will receive almost pure oxygen at higher altitudes.

Returning to FIG. 1, it will be seen that the control system 21 provides control of the partial pressure at the lower end of the curve shown in FIG. 2. In practice, when the pilot is flying the aircraft at lower altitude the oxygen generator would provide a normal 95% (or thereabouts) oxygen. However, because of the partial pressure setting in the control system 21, the solenoid operated valve would be wide open causing a bleed through the device 10 which would in effect create a larger demand on the oxygen generator. As a result nitrogen passes through the oxygen generator and the breathing mixture of oxygen and nitrogen is sensed by the control system 21 which then in effect sets the solenoid operated valve to maintain the preset partial pressure as the aircraft gains altitude up to about 13,000 feet. At this point, the aneroid bellows begins to close off the opening from the chamber 24 and in effect begins to restrict flow through the device. Consequently as this restriction slows down the flow through the device, the demand on the oxygen generator is reduced, and consequently the oxygen percentage concentration received by the pilot increases. This continues to the point where the aneroid bellows closes the chamber 24 completely cutting off flow through the device. The control system responds by opening the solenoid valve fully in an attempt to reduce the partial pressure, but of course there is no flow and the device becomes inactive.

Irish Examiner - World News - 15, February, 2001

Irish Examiner.com

Bottled oxygen could protect against blood clots

By John von Radowitz

A PERFORMANCE boosting oxygen enhancer used by athletes may offer some protection against economy class syndrome, it was claimed yesterday.

The liquid, developed in California, helps the body extract more oxygen from the air, raising blood levels by up to 3%.

Olympic athletes have used the supplement, called OxyMoxy, as have asthmatics and other people with breathing difficulties. But the liquid might also offset the danger of suffering clots in the legs on long distance flights, claim its British suppliers.

The condition, known as deep vein thrombosis, or DVT, can be fatal if a clot breaks away and reaches the lungs. Recent research has indicated a link between low cabin pressure and oxygen concentration in aircraft and the risk of clots.

A Norwegian study published in the Lancet medical journal suggested that hypoxia lack of oxygen in pressurised aircraft triggered blood thickening.

The researchers, from Ulleval University Hospital in Oslo, found that the blood of volunteers placed in an oxygen thin room designed to simulate an aircraft cabin started to coagulate. This appeared to coincide with activation of a blood protein which promotes clotting.

Deep vein thrombosis encountered on flights is usually blamed on sitting for long periods in cramped conditions and dehydration. But the Norwegian researchers, led by Bjorn Bendz, said sitting still and lack of fluids could not explain the blood thickening effect.

They speculated that even a small amount of hypoxia could induce activation of the clotting protein Factor VII.

British distributors Resonance, a health food company based in Totnes, Devon, maintain that if this is true, OxyMoxy might offer some protection.

"It allows the body to extract a higher percentage of oxygen from the air we breathe, which may be crucial in the cabin of an aircraft where there is already a depleted supply," said a spokesman. "We would suggest taking it before or during a flight to combat the effect of low quality recycled air."

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Regarding claims 1 and 2, the further requirement that the level to which the cabin air is oxygenated is greater than eighty percent of that which is experienced at standard sea level atmospheric pressure (see paragraph 6 of the original disclosure) has been added. This claimed limitation is not disclosed, taught or suggested in any of the references of record, or any appropriate combination thereof.

Claims 3 and 8 have been amended to clarify that the non-habitable region to which the high-concentration nitrogen is dispensed is outside the fuel tank as is clearly defined at least in

paragraph [0018] of Applicant's original disclosure. New claims 11-20 have been added to specifically recite certain exemplary regions suitable for receiving high-concentration nitrogen; i.e., a cabling duct, a baggage compartment, a radio rack compartment, and an electrical wiring compartment - - and none of which are disclosed, taught or suggested in any of the references of record, or any appropriate combination thereof.

A careful review of paragraphs [0019], [0020], [0021] and [0024] from Mitani above demonstrates that there is in fact no disclosure of "continuously detecting absolute pressure and oxygen percentage in areas of the aircraft, computing partial pressure of oxygen in those areas and reporting the resulting partial pressure of oxygen values to a central control system" as recited in claim 4; therefore, reconsideration and withdrawal of the rejection is respectfully requested.

Regarding claim 5, the comparison below is instructive between claim 5 and the cited paragraph [0024] of Mitani:

5. (Currently Amended) A method for controlling the degree of oxygen/nitrogen shift of incoming air in response to the partial pressure of oxygen in areas of the an aircraft, said method comprising: continuously reconfiguring the system pressures and flows in response to reported partial pressure of oxygen values, flight parameters, aircraft configuration and smoke/fire warning status.	[0024] In case that the airplane cruises at a high altitude, the temperature of the airplane surface rises due to heat generated by passengers or electronic equipment, which will lead the air conditioning into a slight cooling mode even at extremely low temperature of atmosphere (approximate minus 60 degrees Celsius). In this case, there is no need of refrigerating the air down with the vapor cycle system 6. The air that is refrigerated by the heat exchanger 5 and the extracted air whose temperature is controlled by a temperature control valve 23 are mixed with by-passed as shown by imaginary line in FIG. 1 and supplied to the cabin 2. Needless to say the above-mentioned effect can also be produced with this arrangement.

From this comparison, it is clear that the subject matter of claim 5 is not anticipated by Mitani; reconsideration and withdrawal of the rejection is respectfully requested.

Regarding claim 6, Mitani dispenses nitrogen to the fuel tank; not only is it not disclosed to re-mix the fuel-tank-stored nitrogen into a passenger habitable cabin, this potentially fuel vapor-contaminated nitrogen would not be supplied to the habitable cabins for passenger breathing and potentially fueling or fostering a fire therein. In other words, it would be highly

undesirable to mix nitrogen from the aircrafts fuel tank into the passenger cabin. In view thereof, reconsideration and withdrawal of the rejection is respectfully requested.

Regarding claim 7, it is reminded that a determination under 35 U. S.C. § 103 is whether the claimed invention as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. *In re Mayne*, 104 F.3d 1339, 1341, 41 USPQ 2d 145 1, 1453 (Fed. Cir. 1997), emphasis added. In Porlier, there is no "nitrogen rich air that is stored in a non-habitable area of the aircraft" and then introduced "into the occupied, oxygen enriched area." Further, the oxygen rich steam from the air separators is not dumped overboard as claimed by Applicant. Therefore, reconsideration and withdrawal of the rejection is respectfully requested.

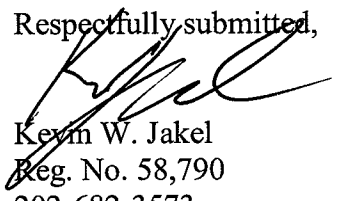
In view of the above, Applicant requests reconsideration and withdrawal of the rejections of the claims and that the Examiner indicate the allowance of the claims in the next paper from the Office.

Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. The Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. The Applicant believes that a full and complete response has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment is respectfully requested.

Respectfully submitted,



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